

WHAT IS CLAIMED IS:

1. An atomizer having a gas flow inlet, and an aerosol outlet, a source of gas connected to the gas flow inlet, an orifice forming a gas jet between the inlet and the outlet, and a source of liquid to be atomized connected to be introduced in the gas jet, at least one of the sources comprising a plurality of different gas or liquid respectively, selectively provided to the atomizer.
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- 10 2. The atomizer of claim 1 wherein the source providing a plurality of different gas or liquid comprises a source of gas connected to the gas flow inlet of the atomizer, and having a plurality of
15 different types of gas introduceable into the inlet.
3. The atomizer of claim 1 wherein the source comprising a plurality of different gas or liquid material is the source of liquid, and a plurality of
20 different liquids selectively introduceable into the atomizer.
- 25 4. The atomizer of claim 1 wherein the atomizer has a plurality of passageways defined therein, the source having a plurality of gas or liquid comprising a plurality of gas sources, and each gas source connected to a separate passageway, and wherein the source of liquid comprises a plurality of different types of liquid, each source of the different types

of liquid being connected to a selected one of the passageways of the atomizer.

5 5. The atomizer of claim 1 wherein each of the sources has a flow controller between the source and the atomizer.

10 6. The atomizer of claim 1, wherein both of the sources comprise a plurality of gas or liquid materials from the respective sources.

15 7. A vaporization system for vaporizing materials carried in a gas stream, the vaporizer comprising an outer housing defining a chamber, a heated surface member in the chamber, a first source of at least one gas connected to the inlet of the chamber, a second source of at least one liquid to be carried in the gas and into the chamber, wherein at least one of the first and second sources comprises a plurality of
20 different materials consisting of one of the respective gas and liquid for introduction into the chamber to be vaporized therein from heat on the heated surface member.

25 8. The vaporization chamber of claim 7 wherein the first and second sources are connected through an atomizer to the vaporization chamber.

9. The vaporization chamber of claim 7 wherein the vaporization chamber has an inlet, the first and second sources being connected to the inlet passageway in a manner such that the gas from the first source will engage liquid from the second source as the gas moves toward the inlet to the vaporization chamber.

10. The vaporization chamber of claim 7 wherein the inlet is connected to an outlet of an atomizer, said first and second sources being connected to the atomizer to cause atomization of liquid from the second source in a gas from the first source.

11. The atomization chamber of claim 7 including a controller for controlling flow of materials from the first and second sources, and controlling the heat on the heated surface member in the vaporization chamber.

12. The vaporization chamber of claim 10, wherein the vaporization chamber has an outlet, and wherein a chemical vapor deposition chamber is combined with the vaporization chamber, the outlet of the vaporization chamber being connected to an inlet of the chemical vapor deposition chamber.

13. The vaporization chamber of claim 12, wherein the atomizer comprises a plurality of passageways

therethrough, each of the passageways being connected to receive a different gas from the first source, and where each passageway in the atomizer forms a gas jet, and a connection to receive separate liquid from the second source into a flow path subsequent to the formation of the gas jet, and the outlet of the atomizer being connected to the inlet of the chemical vapor deposition chamber.

10 14. The vaporization chamber of claim 7, wherein each of the first and second sources have a flow controller controlling flow from the respective source to the vaporization chamber.

15 15. The vaporization chamber of claim 14, wherein there is a separate shut off valve between each flow controller and the vaporization chamber.

16. A chemical vapor deposition system comprising a chemical vapor deposition chamber having an inlet, and a source of deposition materials for forming thin films on wafers in the chemical vapor deposition chamber comprising a vaporizer chamber connected to the inlet of the chemical vapor deposition chamber, said vaporizer having a heated surface portion, and a first source of a gas for introduction into the vaporization chamber through a connecting passageway, said first source having a plurality of different gaseous materials selectively introduced into the

passageway to form a flow of gas, and a second source of liquid material forming a source of at least one precursor liquid chemical for deposition in the chemical vapor deposition chamber connected to the passageway in a flow path subsequent introduction of the flow of gas through the passageway, whereby droplets of at least one liquid are mixed with the gas prior to introduction into the vaporization chamber.

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17. The system of claim 16, wherein the inlet to the vaporization chamber is connected to an outlet of an atomizer, the first and second sources being connected to the atomizer such that a plurality of different liquids can be selectively atomized sequentially or simultaneously and introduced into the vaporization chamber.

18. The system of claim 17, wherein the atomizer has individual atomizer passageways in a single atomizer head, each passageway being connected to one of a plurality of gasses the first source, and one of a plurality of liquids from the second source.

19. A method of providing vaporized liquids to a process chamber comprising the steps of providing a vaporization chamber having a heated surface portion therein, providing at least two separate sources of liquid for introduction into an inlet of the

vaporization chamber, selectively controlling the flow of liquid from one or more source to the inlet, and mixing the selected liquid with a carrier gas prior to introduction of the liquid and gas into the
5 vaporization chamber.

20. The method of claim 19, including forming a gas jet from the gas, and introducing liquid into the gas jet to form an aerosol prior to introduction of the
10 liquid into the vaporization chamber.

21. The method of claim 20, wherein forming of the gas jet comprises forming the gas jet in an atomizer arrangement, and providing at least two liquids
15 selectively in sequence or simultaneously to the atomizer arrangement for atomization prior to introduction into the vaporization chamber.

22. A vaporizer for an aerosol comprising a gas and
20 liquid droplets, said vaporizer including a housing defining an interior vaporization chamber having an inlet and an outlet, a first metal block having a plurality of passageways therethrough, a bore through the first metal block aligned with the inlet, through
25 which the aerosol is discharged, and an orifice in the metal first block directly aligned with the inlet, said orifice forming an opening leading to the bore in the first metal block.

23. The vaporizer of claim 22, wherein the orifice is no greater in size than substantially the same size as the bore.

5 24. The vaporizer of claim 23 wherein the aerosol forms a gas jet through the inlet, and an orifice in the first metal block directly aligned with the inlet, said orifice forming an opening leading to the bore in the first metal block.

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25. The vaporizer of claim 24 wherein the orifice comprises a mixing orifice, and the velocity of the gas jet causes a recirculation from an output side of the bore of the first metal block through the plurality of passageways in the first metal block back toward the inlet for mixing with the aerosol as the aerosol passes through the mixing orifice.

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26. The vaporizer of claim 22 wherein there is a second metal block in the interior vaporizer chamber having a plurality of passageways therethrough, the second metal block being spaced from the first metal block and positioned between the first metal block and the outlet of the vaporizer.

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27. The vaporizer of claim 26 wherein the second metal block has an imperforate surface aligned with the bore in the first metal block to divert gas

striking the imperforate surface laterally outwardly toward the passageways in the second metal block.